



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2006CA171B

Title: Diuron in California's Water Supply

Project Type: Research

Start Date: 03/01/2006

End Date: 02/28/2007

Congressional District: 44

Focus Categories: Water Supply, Water Quality

Keywords:

Principal Investigator: Young, Thomas Michael (University of California, Davis)

Federal Funds: \$14,638

Non-Federal Matching Funds: \$29,713

Abstract: Diuron, an herbicide applied at a rate of over 1.1 million pounds of active ingredient per year in California since 1993, has been widely detected in California's water supply. During 2004, for example, diuron was found at levels exceeding 1 ug/L for more than two months in the California Aqueduct, which supplies water to millions of residents in southern California. The question at the center of this proposal is whether diuron and/or its degradates form toxicologically significant amounts of the potent carcinogen N-nitrosodimethylamine (NDMA) or other byproducts during water disinfection. NDMA can be formed from dimethylamine (DMA) during water chlorination or chloramination, and diuron degradation in the environment by biotic and abiotic processes can produce DMA. The transient nature of diuron's appearance in water supplies, and the infrequent testing by water utilities for compounds that have not recently been detected and which do not have established maximum contaminant limits in drinking water, make it possible that byproduct formation may go undetected. Known precursors of NDMA cannot account for the full amount of its formation in water and wastewater samples according to previous research; it is possible that diuron represents a previously unrecognized contributor to NDMA formation. Chlorinated anilines represent another chemical class

likely to be formed during chlorination of aqueous diuron solutions and which may pose toxicity concerns.

The objectives of this proposal are to: (1) Determine the rate and extent of toxic byproduct formation during chlorination or chloramination of diuron containing waters supplied by the California Aqueduct, and (2) Assess the range of human exposure to diuron's byproducts via treated waters derived from the California Aqueduct through a combination of field sampling and modeling. Batch tests will be conducted to identify and quantify the formation of byproducts when water that contains diuron at environmentally relevant concentrations is treated by chlorination or chloramination (a common substitute for chlorination) under a variety of possible treatment system conditions (pH, nitrite and ammonia concentration). The kinetics of byproduct formation will be assessed and will be used in an idealized model of the Aqueduct and its associated reservoirs and water treatment facilities to predict the exposure of consumers to potentially toxic byproducts of diuron degradation and to diuron itself. Findings from this research have direct implications for the safety of water delivered in the California Aqueduct and also provide insight into the difficulties associated with regulating the byproducts of environmental contaminants, especially those with transient input cycles.

[U.S. Department of the Interior](#), [U.S. Geological Survey](#)

URL: <http://water.usgs.gov/wrri/06grants/2006CA171B.html>

Maintained by: [John Schefter](#)

Last Updated: Wednesday, September 06, 2006

[Privacy Statement](#) // [Disclaimer](#) // [Accessibility](#)